AN OBSERVATION OF MALE-MALE COMBAT IN GWARDARS OR WESTERN BROWN SNAKES (*PSEUDONAJA MENGDENI*) ON DIRK HARTOG ISLAND, WESTERN AUSTRALIA

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INTRODUCTION

Observations of male-male combat in Australian elapid snakes was once rarely documented, but in recent times has been regularly reported (Clemann *et al.* 2010; Lloyd and Trembath 2010; Trembath *et al.* 2006; Jenner 2004; Fearn and Staubmann 2001; Clemann and Saddlier 2000). Combat in some large elapid species has been documented on several occasions in the field i.e. *Pseudechis porphyriacus* (Shine *et al.* 1981). However, for one widespread species, the Gwardar or Western Brown Snake (*Pseudonaja mengdeni*) the only documented observations of combat bouts have been in captivity (Fyfe 1993, as *P. nuchalis* from the Alice Springs area). Shine (1989) mentions an observation of a combat bout in *P. nuchalis* from Kinchega National Park in New South Wales, though this account is most likely based on the species *Pseudonaja aspidorhyncha*, following the recent taxonomic revision by Skinner (2009). However, the potential for *P. mengdeni* to occur in that region cannot be completely ruled out.

The increasing number of documented combat bouts exhibited by a range of species is steadily adding to our knowledge of elapid snake behaviour. Documentation includes the behaviours of bouts, durations and multiple confrontations by the same individuals over several days (Lloyd and Trembath 2010; Fyfe 1993). Here we describe a combat bout in wild *P. mengdeni*, a behaviour potentially observed, photographed and documented for the first time, at least in Western Australia. Observations such as these highlight that although for a very widespread species, they are typically elusive and underlines how very little we know about the natural history of even the large venomous snakes.

OBSERVATION

On 24 October 2011, two large, adult (~1.2m) *Pseudonaja mengdeni* were observed in a combat bout on a sandy track amongst coastal dunes in the vicinity of Louisa Bay on Dirk Hartog Island, Western Australia (25°46'35" S, 113°04'56" E). The snakes were initially observed from a vehicle at 16:30, two hours before sunset, where our attention was drawn to them thrashing about in a wheel rut.

We observed the snakes from the vehicle for about five minutes to avoid disturbance, during which the snakes were locked into an extremely tight, intertwined 'corkscrew' posture, with their heads and tails thrashing about (Figure 1). Their movements from side to side were very quick, however they gained very little distance and tended to writhe around on the same spot. During approximately five minutes of undisturbed observation, the combating varied between tight plaiting of at least two thirds of the body, to lying almost side by side, with their bodies only slightly intertwined (Figures 1 and 2). During the bout, attempts were made by both snakes to pin the other's head down (Figure 2). Some hissing was also heard as the snakes raised their heads and fore bodies off the ground, though no throat inflation or attempts to bite or damage one another were made and no bite marks or damage to either snake was observed.

After this time, we approached them on foot to attempt further observations of their behaviour and take photographs. However, they quickly became aware of our presence and gradually ceased combat. Within minutes, the darker individual fled the area, leaving the black and yellow animal on the road, which seemed 'confused' about the departure of the other snake, displaying slow movements of the head and neck and repetitive tongue flicking at the combat scene. It then slowly moved in the direction of the other snake, disappearing into dense buffel grass and *Acacia* scrub.

DISCUSSION

The combat observation reported here in the field is essentially similar to those described for many other large elapids (Clemann *et al.* 2010; Lloyd and Trembath 2010; Trembath *et al.* 2006). The current bout was observed within the known breeding season of the species (Shine 1977 as *P. nuchalis*), which is another common trend associated with combating snakes. This suggests that combat bouts may occur with the increased movements of male snakes during this time (i.e. they are more likely to come into direct contact) and the potential competition for females.

Fyfe (1993) reported on *P. mengdeni* combat bouts observed in a confined, captive situation, whereby combat was initiated when a non-resident male was

Figure 1. Male *P. mengdeni* exhibiting the tight, intertwined 'corkscrew' posture, a behaviour commonly observed in snakes whilst engaged in intense, ritual combat displays.

Figure 2. One snake potentially 'over-powering' the other by making an attempt to pin his opponents' head to the ground.

introduced into a cage with multiple resident males and a single resident female. Although the 'typical' combat behaviours were not always observed in the captive snakes, Fyfe's observations suggested that the triggers for competitive/combat behaviours could be potential competition, possibly overcrowding, and the presence of a female. Although intersexual display and/or intrasexual competition are probably major factors in the current bout, the time of day and thick cover into which both snakes disappeared made it very difficult to observe them after they fled. It also made a search for a potential female snake almost impossible, and consequently a female was not located. Neither of the combating snakes was captured nor did we stay in the area to wait for a possible rematch between the snakes. The same track was driven four times a day for the next two consecutive days after this observation, though no subsequent bouts were observed.

Fyfe (1993) also noted additional behaviours such as biting of the body and tail, and chasing 'rival' individuals, with biting often occurring after the fleeing of one snake. However, in the current bout, upon fleeing by one individual, the second individual did not give chase and remained at the combat site. These behaviours however, at least the fleeing of one individual, was most likely a direct result of our presence, as the dark animal fled soon after our approach, a sometimes consistent behaviour typical of the genus *Pseudonaja*, their disposition being 'highly nervous'. Neither snake made an attempt to bite nor were there signs that biting occurred. Although biting and more aggressive behaviour could potentially have occurred later in the combat (if not disturbed), the current bout was only observed for a short period of time and the total duration of the combat is not known. However, tracks left in the sand from before the combat was observed went for almost 15 metres along the track. By the slow rate at which the snakes were observed to be progressing and by slow rates previously observed in other large elapid species (Lloyd and Trembath 2010), the snakes had probably been involved in the battle for quite some time.

'Clean' bouts (non-damaging contact) may be a preferred option by many elapids in the field, as few combat observations report biting behaviours (Fyfe 1993; Turner 1992), and as such, biting may be a behaviour that is prompted through confined conditions. Combat in elapid snakes often occurs in species where males are larger than females (Shine 1978), whereby fights are simply wrestling matches, attributed to a 'test of strength' between individuals. There are clear disadvantages involved in the infliction of open wounds during combat. It

may lead to infection and possibly other problems, and we would assume biting would normally be avoided by combating elapids, and only used as a last resort. Combat in *Pseudonaja* should be no exception, and although both sexes attain similar lengths, males have an increased body mass which may also be attributable to strength during such combat bouts.

In any case, this observation does not fully explain the reasons behind such intense combat behaviours, but adds to our knowledge of their occurrences. This paper reports on a species that has had few documented combat bouts, and offers a comparison between snakes in the field and in captivity.

ACKNOWLEDGEMENTS

Thanks to Dane Trembath for providing comments and valuable references. Also thanks to Andy Spate for fieldwork assistance during the expedition and to two anonymous referees for valuable comments on an early draft.

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